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# The Multi-Channel CRM Application Framework for M-Business Practices

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**Abstract:** In every industry, customers' preferences are changing faster than ever before. Customers can no longer be categorized into well-defined market segments or homogeneous groups. They need to be treated as individuals each with specific needs. The information must be available to anyone from anywhere at anytime. Therefore, service quality becomes an important measure for both enterprises and customers. In real-time economy, sales and services have deep impacts on up/downstream decisions, as well as decisions related to supply chain trading partners. Thus, customer relationship management (CRM) has more transparency than ever, by shifting from a sales productivity tool to a technology-enabled relationship management strategy. Today's businesses are typical collaborative multi-enterprise multi-channel supply chain consisting of several specialists. Mobile technology and personalized customer care open the door to new opportunities by offering value-add services in CRM practices. The key to customer satisfaction and loyalty resides in the enterprise's core offering and efficient transaction management. This paper provides a broad discussion on the design of mobile-to-enterprise application framework for CRM practices. The purpose is to provide an overview and schematic to design an integrated mobile CRM suite. The ideal of this approach is to maximize the value of an enterprise's customer portfolio through more efficient and effective marketing, sales, and customer service and to put the customers in control, by providing self-service and solution-centered support. With the mobile CRM application framework, the enterprise is also extended to suppliers and trading partners so that when customers get in contact with the resources of an enterprise, they also touch the resources of the value chain. The customers who drive the entire value chain (or supply chain), determine what is to be produced, when it is produced, and at what price.

## I. New Dimension of Channel Integration

Today, customers are in charge and make the rules. Consumers are demanding solutions customized to meet their specific needs. Consequently, the challenge is shifting from product-centric marketing to customer-centric marketing. Whenever an innovation is introduced, it brings both new challenges and business opportunities to enterprises. The e-business comes a long way from hype to mature. The mobile solutions will build on the top of the existing e-business investments. The m-business is facilitated by the

integration of the Internet, e-business, and the wireless world where customers can go online with any device at anytime from anywhere [1]. Mobile businesses open up new opportunities for innovated enterprises and give them new means of communications with inside/outside stakeholders. In a changing business landscape, mobile business addresses new customer channels and integration challenges. In order to compete in today's real-time economy, every business must be able to quickly identify and respond to the changing market conditions and customer needs. These sales challenges are made worse further by difficulties in pricing, promotion, and relationship-management. In real-time economy, sales and services have deep impacts on up/downstream decisions, as well as decisions related to supply chain trading partners. Thus, in m-business era customer relationship management (CRM) has more transparency than ever, by shifting from a sales productivity tool to a technology-enabled relationship management strategy in a global supply chain scheme. The CRM is a combination of business process and technology seeking to profile an enterprise's customers from different perspectives [2]. It contains call center service and support, customer contact management, and sales/marketing automation that help to acquire/retain customers and eliminate operation inefficiencies by streamlining and unifying customer information and other internal/external inter-enterprise process integrations.

Enterprises focus on how to use mobile technology to provide customers with rich service experiences and greater satisfactions. Mobile applications are beginning to play a central role in enabling real-time CRM. Enterprise must design a mobile application framework for both customers and their suppliers. The usefulness of the mobile channels will be largely driven by new enterprise applications that enhance the overall customer values. Seeing m-business processes in terms of a net value added chain is a good approach for visualizing current and future competitive advantages. The creation of these values depends on the enterprise's ability to coordinate and link those internal/external activities efficiently.

## II. The Mobile Value Proposition

As the global economy shifts toward the mobile economy, enterprises need to be progressively more flexible and globalize. The mobile business strategies will focus on what "value" might be created for the customers and enterprises in the marketplace. To gain competitiveness and create values, the enterprise should target on redesigning their core

business processes in response to key competitive factors. These competitive factors can be derived from the Porter's value chain [3]. The value chain divides the organization into a set of generic functional areas, which can be further divided into a series of value activities. In the value chain, there are two distinct types of functional area: primary and support (Figure 1). Primary activities are concerned with the direct flow of production (such as inbound logistics, operations, outbound logistics, marketing, sales, and service), whereas support activities (firm infrastructure, human resource management, technology, and procurement) support the primary activities and each other. Starting with its generic value chain categories, a firm can subdivide into discrete activities, categorizing those activities that contribute best to its competitive advantage. The value is measured by the amount customers are willing to pay for an organization's product or service. Primary and support activities are called value activities, and an enterprise will be profitable as long as it creates more value than the cost of performing its value activities [4]. In this way, a value chain is defined and a better organizational structure and business process can be created around those value activities that can most improve an organization's competitive advantage [5].

Porter also recognized linkages outside the enterprise, as they relate to the customer's perception of value. This provides the possibility that one value chain could be linked to another value chain, because one business partner could be the other's customer. This interconnected value chain system can act as a supply chain that encompasses the modern business world, and participating organizations can readily extend their technologies to their partners. The "extended enterprise" aspect enables supply chain integration, more effective outsourcing, and self-service solutions for both internal and external stakeholders [5]. The usefulness of the mobile channels will be largely driven by new enterprise applications that enhance the overall customer values. A business that creates m-business applications can benefit from the first-to-market advantage.

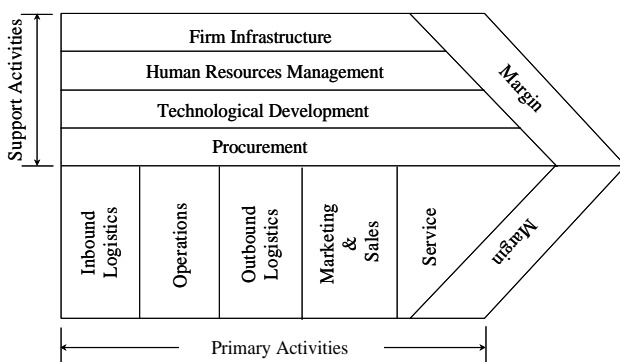


Figure 1. Porter's Value Chain (After Porter, 1985)

As the wireless Internet continues to expand, first-to-market organizations will have already secured a customer base. It can be foreseen that the m-business market value will be astronomical.

### III. Customer Portal : One for All

As mentioned before, seeing m-business processes in terms of a net value added chain is also an approach for visualizing current and identifying future competitive advantages. In short, the creation of these values depends on the enterprise's ability to link and coordinate these internal/external activities efficiently [3]. This interconnected value chain system can act like a supply chain that encompass the modern business world, and participating organizations can readily extend their technologies to their partners.

Emphasis has been placed on the back-office integrations since the emerging of new supply chain practices in the mid-1990s. Today, there are many strategies on the enterprise back-office system integrations, such as enterprise resource planning (ERP) and enterprise application integration (EAI). These solutions are trying to create a unified communication channel that allows enterprise business processes to permeate different departments, divisions, and supply chain partners. In the meantime, there is a growing trend in the marriage of ERP with CRM [6]. The reasons are in two folds; (a) to maintain the integrity of business processes from production to sales automation and (b) the growing importance of customer care. With the combination of ERP and CRM, the enterprise will be more adaptive and flexible to engage customized services. In today's e-commerce, the customers are in control, and a business must realign its value chain around the customers to eliminate inefficiencies and customize information, products, and services. A set of CRM is not enough to handle diverse group of customers, especially when dealing with one-to-one relationship marketing. To maximize selling power and retain customers, CRM is becoming the central issue in gluing enterprise back-office business-to-business (B2B) and store-front (or front-end) business-to-customer (B2C) practices (Figure 2). The applications of CRM, by definition, must automate processes across multiple user types and functional areas. CRM is a broad set of sales/marketing solution that includes the following strategic areas: data acquisition and analysis (such as data mining and warehousing), marketing intelligence (such as business intelligence tools), sales force automation (SFA), customer services (such as CRM), product catalog and pricing services, proposal/quote/contract management, order management, fulfillment, and the integration of back-office system (such as ERP). The purpose of CRM is to build an adaptive marketing strategy such that the entire selling process will be more active and flexible than traditional 4Ps (product, price, place, and promotion) marketing approaches allowing sales teams to better handle any sales activities.

The IP convergence strategy will provide a solution that joins the two worlds of voice communications (telephony) and data traffic together. Technologies, such as interactive voice response (IVR), computer telephony integration (CTI), are beneficial to CRM. The fully interactive nature of the Internet changes everything in the world of self-service.

The blending of Sales Force Automation (SFA) with customer self-service brings new business opportunities. Relevant information and intelligence support processes all can be aligned and implemented in real-time at anywhere. This new dimension of channel integration strategy increases customers' value by satisfying customers' requirements and providing them with the best solution. With marketing intelligence, personalized customer care service will offer valued-added one-to-one relationship marketing to enhance individual purchasing experience and retain customer loyalties with enterprise. This effort can be achieved through the introduction of business intelligence in selling chain practices.

#### IV. Technological Framework

CRM suite, with an emphasis on purchasing process and customer care, represents a new shift in enterprise computing. This new dimension of channel integration brings both opportunities and challenges to enterprise to refine their business strategies and supporting information systems. The application of CRM includes technologies from initial customer contact to production and delivery of final goods or services. The scope also focuses on the gathering of customer data and information. Data acquisition is an important issue in CRM. The technologies to facilitate these highly interactive communications are summarized in Figure 3. In today's e-commerce practices, all business data are transmitted over a variety of communication channels because the essence of e-commerce lies in the communications of business data among organizations, supply chain trading partners, and customers. For a typical buying pattern, click-stream through an enterprise's web site, buttons pushed on a touch-tone phone, postal mail/email and faxes are all part of communication with customers. This information by now is not captured in meaningful way to maintain a comprehensive view of the attributes and patterns of customers. With the focus shifts from product-marketing to customer-centric marketing, business intelligence (BI) helps to coordinate information between brick-and-mortar and online initiates. It relies on integrated data from a variety of information sources: web site, call centers, customer profile and transaction log, operational database, ERP system, and even third party data. The BI analytical and segmentation applications offer tools for data mining as well as decision-making in enterprises. In CRM, data acquisition does not only capture customer preferences and patterns, but it also presents customers with personalized information in the purchasing process. The fully integrated CRM application has the ability to record and analyze all the activities of prospects and customers, whether the contact mechanism is via the web or a call center. This "automatically-collected" treasure of user behavior information theoretically gives the enterprise a huge advantage over brick-and-mortar competitors, who cannot easily record customer and prospect behavior.

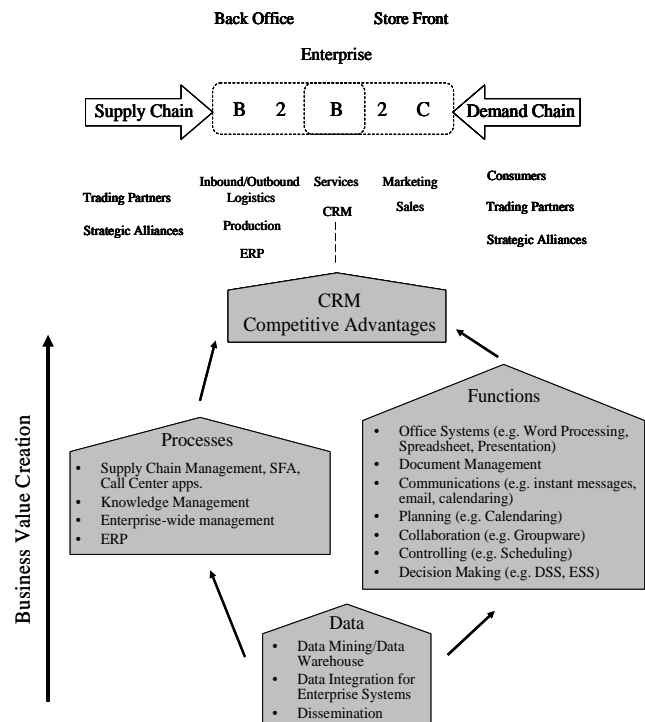


Figure 2. The M-business Value Proposition

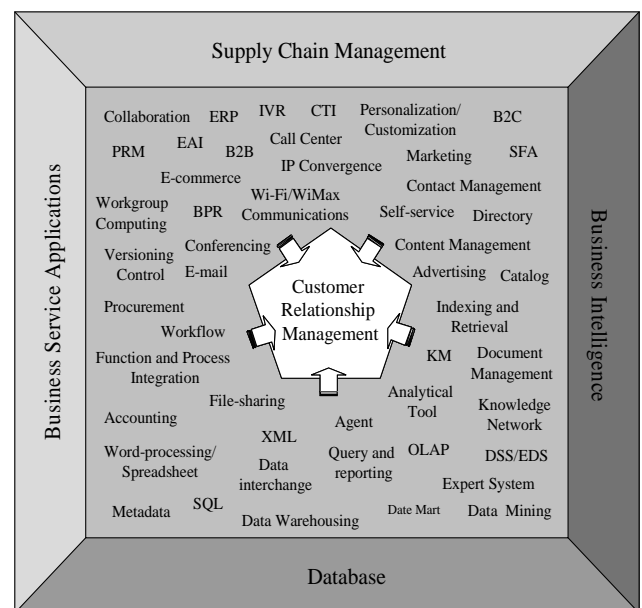


Figure 3. The CRM Technological Framework

The existence of an effective relationship management and click-stream/call-stream data warehouse is one of the most important long-term success differentiators in the e-commerce practices. Other technologies, such as interactive voice response (IVR), computer telephony integration (CTI), are beneficial to CRM. The fully interactive nature of the Internet changes everything in the world of self-service. The blending of SFA with customer self-service brings new

business opportunities. Relevant information and intelligence support processes all can be aligned and implemented in real-time at anywhere.

With the convergence of B2B, B2C, BI, and real-time relationship management, the personalization of customer information is now possible. A robust CRM suite for customer care applications enables new kinds of interactions, new kinds of information, and comprehensive access to all customers and enterprise portals. This customer care can foster joint problem-solving, convenient self-service, and self-selling. Given the information customers need in the purchasing process, they will sell to themselves and service their own information needs. In other words, customers can be an enterprise's best sales forces.

## V. System Architecture

In today's m-business, competing for mobility requires either aligning one's strategy to what the enterprise agility or developing mobile computing capabilities to support a desired supply chain strategy. Mobile business systems must to address the strategic visions of enterprise. A successful mobile business application framework for enterprises should link supply chain management, relationship management, and knowledge management to function in an adaptive way and continue to thrive in the m-business era. The design of a m-business system needs to focus on collaboration. In the mobile CRM system architecture, several dedicated servers and databases are required, because enterprise must capture and retain in a central/distributed data repository the data and information that employees need (Figure 4). A CRM suite for customer care applications enables new kinds of interactions, new kinds of information, and comprehensive access to all customers and enterprise portals. This customer care can foster joint problem-solving, and convenient self-service. Given the information customers need in the purchasing process. The reasons to stress on 3G/4G and include in this framework are (a) it has wider bandwidths, higher bit rates, (b) it support interactive multimedia services, teleconferencing, wireless Internet, etc., and (c) the global mobility and service portability. For knowledge management issues, the architecture of IT in the knowledge management system is concerned with organizing and analyzing information in an enterprise's database so this knowledge can be readily available throughout an enterprise. A central/distributed data repository that provides/captures the data and information for employees and executive decision-making is also very important in a knowledge management system. The database system is the driver that consolidates and directs the overall resources of the supply chain to the most mission-critical business activities. As a result, an m-business CRM solution must provide supports for the capture and communication of customer demand, as well as enable this demand to automatically trigger business events and initiate process workflow. Transcoding contents and developing enterprise applications to work across several mobile devices and

browsers seem to be a complex problem. The key is to focus on the lowest common denominator: the XML (eXtensible Markup Language) and XSL(eXtensible Style sheet Language). The XML supports for developing mobile applications running on multiple devices and platforms [7]. Databases are also working with XML-structured data and tabular relational data. The ability to translate standard HTML/XML content into the various flavors of wireless content is based on the way that the XML/XSL standards operate. Because of these standards, XML is able to function as a meta language, flexible enough to recreate other markup languages and use them as subsets. Technologies such as Java Server Pages (JSP) and Active Server Pages (ASP) are also being extended to support multimode clients. Figure 5 illustrates some examples of transcoding systems and applications. Enterprises that provide HTML to wireless transcoding solutions translate standard content into XML that reflects all of the information flow and logic of the transcoded content, and by browser detection determines for each mobile user which subset of XML to translate content into [8]. Thus we see that a robust and active transcoding system goes a long way toward reducing complexity and maintaining consistency throughout the enterprise across multiple clients.

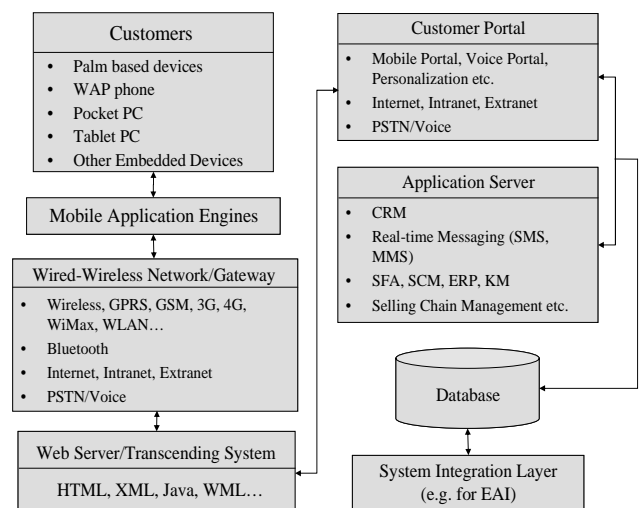


Figure 4. The Mobile Customer Portal System Architecture

Effective m-business supply chain solution will need to deliver an accurate and common view of customer demand data as well as any subsequent events, plans, or other business data. This new supply chain framework will offer virtually unlimited business opportunities in the alignment of technologies and processes. A well-designed and well-integrated supply chain for m-business will improve upon existing cost-responsive processes, and have organizational agility in the event of change.

## VI. Conclusion

Multi-channel and multi-technology strategies represent the

next frontier of sales force integration. The mobile Internet will open an important new channel for commerce. Personalization provides value to customers by allowing them to find solutions that better fit their needs and saves them time in searching for their solutions. By interacting with customers electronically, their buying patterns can be evaluated and the services can be provided. To deliver the right product or service to the right customer for the right price via the right channel at the right time are the essence of CRM.

Content in XML can use XSL style sheets to dynamically render the content into:

- HTML for Desktop and PDA
- HDML or WML for mobile devices
- Specific XML for B-to-B

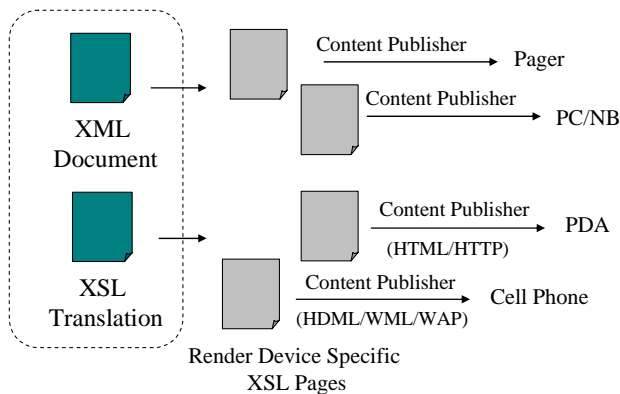


Figure 5 Content Transcoding and Delivery Scheme

This paper shows that the integration of sales, marketing, and customer service applications with business intelligence system will help enterprises to manage one-to-one marketing

and relationship management more effectively. This technological framework still hold promising with the coming era of mobile business. The IP convergence strategy will provide a solution that joins the two worlds of voice communications (telephony) and data traffic together. The integration of voice and data makes office solutions more flexible and easier to manage. Mobile Business opens up new paths to service-oriented information processing and optimizes internal and external communication.

With self-service applications in hand, customers will be able to touch the resource of an enterprise. The customer drives the entire value chain, determining what is to be produced, when, and at what price. The CRM that reinvented itself from traditional sales/marketing strategies will undoubtedly be the best solution to today's e-business Internet marketing.

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